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ABSTRACT

The effects of four educational benefit programs for military personnel were tested nationwide. The four benefit programs included a control or baseline contributory program, the Veterans Educational Assistance Program (VEAP); a second contribution program offering enhanced kickers in the Army, the Ultra VEAP; and two noncontributory plans, the Noncontributory VEAP and a tuition/stipend program. (In a contributory program, the service member contributes to an educational fund with the government matching the contribution at a set ratio. Any enlistee can participate in VEAP; for the other programs, an enlistee must meet a high quality criterion and enter a specified, critical specialty.) The largest estimated response appeared in the Ultra VEAP program that increased Army enlistments by 9 percent. Effects for the noncontributory VEAP program were small. The tuition/stipend program increased Navy and Air Force enlistments by 5 to 8 percent. It also reduced Army enlistments by 6 percent, since the Army could not offer greater benefits than the other services as it does in VEAP. It was shown that educational benefits could produce significant increases in high quality enlistments but lead to a drop in the number of high quality Army enlistments. (YLB)

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A RAND NOTE

ENLISTMENT EFFECTS OF MILITARY EDUCATIONAL BENEFITS

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PREFACE

This Note documents a Rand briefing on the Congressionally mandated Educational Assistance Test Program. Rand presented an earlier version of this briefing, containing interim results from a portion of the test, to the Assistant Secretary of Defense for Manpower, Reserve Affairs, and Logistics in October 1981. This Note updates the results to cover the entire test period. The work was performed under Rand's Manpower, Mobilization, and Readiness research program.

This Note presents a brief summary of results from a major research effort. It was prepared to make these results available to a wide audience as early as possible. The details of the analyses summarized here will be published in future Rand reports.

SUMMARY

In recent years, Congress has shown increased interest in expanding educational benefits for military personnel. Educational benefits are often proposed as a means of increasing the number of enlistments by "high quality" youth (those who complete high school and receive high scores on military aptitude tests). Proponents also argue that a properly structured benefit program could help improve retention rates and, if targeted on hard-to-fill occupational specialties, could channel recruits into skills where they are most needed.

In 1980 Congress directed the Department of Defense (DoD) to conduct a nationwide test of the effects of four educational benefit programs. The test began in late 1980 and continued through September 1981. This briefing provides results from Rand's analysis of the test. We report data on enlistment rates under the test program, as well as results from national surveys of young men.

The four benefit programs, which were offered in balanced sets of geographic areas, include a "control" or baseline and three new educational benefit plans designed by Congress and DoD:

- Control: The basic Veterans Educational Assistance Program (VEAP), in which any service member can contribute up to $2,700 to an educational fund and the government matches his contribution two for one (maximum fund value, including contribution: $8,100). In the Army, a supplemental amount up to $6,000, called a "kicker," is added for eligible recruits (high-quality enlistees in selected skills).
- Ultra VEAP: Expands the Army kickers to a maximum of $12,000 for eligible recruits; the other services offer only basic VEAP.
- Noncontributory VEAP: Provides the $8,100 VEAP benefit to eligible recruits in all services, without contribution; in the Army, kickers up to $6,000 are added.

- Tuition/Stipend: Provides much more generous noncontributory benefits, up to $15,600 indexed for inflation, for eligible recruits in all services. Unlike the other programs, this plan has no kickers for the Army; all services offer the same benefit.

Our analysis shows that in certain instances these programs produced substantial increases in high-quality enlistments. To measure the effects, we compared year-to-year gains in enlistments under the new programs with the changes under the control program. The largest estimated response appeared in the Ultra-VEAP program, which increased Army enlistments by 9 percent. Although the effects for the Noncontributory VEAP program were small and not statistically significant, the Tuition/Stipend program increased Navy and Air Force enlistments by 5 to 8 percent. However, the Tuition/Stipend plan also reduced Army enlistments by 6 percent. We conclude that this reduction came about because in the Tuition/Stipend plan the Army could not offer greater benefits than the other services, as it could in the control program. This indicates that if a uniform benefit like the Tuition/Stipend program were implemented, one result would be a drop in the number of high-quality Army enlistments.

We carried out more detailed analysis using regression models to control for possible imbalances in local unemployment rates, civilian wage rates, the services' recruiting force levels, program advertising, and trends over time. None of the resultant adjustments made a substantial difference in our estimates of the test program effects. In addition, to measure program implementation we examined survey data on young men's awareness of the programs and the information they received from recruiters. The survey results revealed no substantial differences among the test areas or among the services, indicating that the programs were uniformly implemented.

Among the specific features of the test programs was their restriction to certain "targeted" skills. We were able to observe an important effect of skill targeting because during the test the Army expanded the list of eligible skills: In the first phase, almost all

eligible skills were in the combat arms, but the expanded list included many noncombat jobs. Between the two phases, the proportion of enlistees entering the combat arms fell, while the proportion entering the newly eligible skills rose. Thus, recruiting for the combat arms was hurt by opening the benefits to noncombat skills.

To assess other features of proposed programs, we examined survey data obtained from young men applying for military service. The survey results showed that enlistment probabilities of military applicants are much more strongly affected by the basic amount of an educational benefit than by any specific features such as inflation indexing, options for in-service use, or provisions to repay existing federal education loans for the enlistee. Finally, the survey suggested that cash bonuses, as well as educational benefits, can be effective incentives for attracting high-quality personnel.

The test has shown that educational benefits can produce significant increases in high-quality enlistments. However, those effects depend on the structure of the benefit plan--for instance, the degree to which benefits are targeted on particular subgroups. A program that offers the same benefit to all services, such as the Tuition/Stipend program, could reduce Army enlistments. Moreover, opening the benefit program to enlistees in all skills might draw recruits out of the combat arms into skills that are apparently more desirable. Although a uniform program open to all enlistees was not tested, the above findings raise concern that such a program could create some undesired effects. In addition, the results imply that a targeted program can improve manning in hard-to-fill specialties while at the same time increasing the overall number of high-quality recruits.

EFFECTS OF MILITARY EDUCATIONAL BENEFITS

January 1982

The Rand Corporation
Santa Monica, California

Figure 1

INTRODUCTION

In recent years, Congress has shown growing interest in educational benefits for the military. In 1981, for instance, ten legislative proposals were introduced to expand veterans' educational assistance or to restore the old GI Bill. Although in the past such programs were advocated for their value to military personnel or to society at large, today's debate focuses increasingly on the recruiting effects of educational benefits--the extent to which they would help to man the all-volunteer force.

This briefing presents results from a recent Rand study of military educational benefits. The study was undertaken to evaluate the 1981 Educational Assistance Test Program, a nationwide experiment mandated by Congress to help the military services recruit highly qualified personnel. We stress that the test plan, unlike the GI Bills of the past, was "targeted"--that is, limited to qualified individuals serving in critical skills. However, our analysis includes interpretations bearing on the effects of a general educational entitlement, as well as those of more limited programs.

The test included four benefit programs formulated jointly by Congress and the Department of Defense. Rand designed the experimental methodology for testing the four programs in matched geographic areas across the nation. In addition, we analyzed the data as the experiment progressed, and reported our interim results to both Congress and the Department of Defense. This briefing presents our final results and summarizes the principal findings of the study.

POLICY ISSUES

- Attracting high quality recruits
- Targeting critical skills
- Effects of special features
- Retention effects

Figure 2

POLICY ISSUES

The policy issues relevant to this briefing fall into four general areas (Fig. 2). First, there is the basic question of the test: Are educational benefits effective in attracting high quality recruits? If so, which of the test programs is most effective, for which services, and under what circumstances?

A second issue concerns the scope of an educational benefit program: Should it be offered to all enlistees or should it be targeted on particular subgroups, such as those serving in critical skills? The test, which was restricted to certain skills, affords an opportunity to assess the effectiveness of educational benefits for channeling recruits into jobs where they are most needed.

A third issue arises from the wide variety of specific benefit features in proposals being considered by Congress. All proposals offer a basic level of payments for postservice education. But in addition, some would automatically increase the benefit to keep pace with inflation; others would make payments for in-service education; still others would have the government repay past federal education loans, and so forth. Since some of these features are likely to be quite costly, we are interested in their effects on enlistment rates.

Finally, it is widely recognized that postservice educational benefits have a negative effect on retention: They encourage people to leave the military after the first term of service. Several proposals seek to counter this effect by offering reenlistees certain substitute incentives, such as the option to transfer benefits to dependents. Such provisions would increase the cost of the program, and their effects on retention are uncertain.* The 1981 test did not permit us to study those effects directly, but the complex interaction between recruiting incentives and retention rates should be considered in the design of a total program.

*In 1981, each service implemented a small-scale test of educational benefits for retention, but the restrictions on that test (a tight budget constraint, small sample size, and lack of experimental control) made it impossible to draw firm conclusions about retention effects.

BRIEFING TOPICS

- Background
- Test results
- Structuring a program
- Conclusions

Figure 3

BRIEFING TOPICS

Fig. 3 shows the sequence of topics we cover in addressing the policy issues. First, we review the background and design of the test program. Second, we present the basic results of the test. Then, we take up some of the more detailed questions that must be addressed in structuring a benefit program, and finally we present the conclusions drawn from the study.

BASIC VEAP PLAN

- All personnel eligible to participate
- Contributions up to $2700 matched 2 for 1
- "Kickers" up to $6000 in Army
- Concerns about:
  - Small size of kickers (Army)
  - Contribution requirements (Congress)

Figure 4

BASIC VEAP PLAN

Now, let me turn to the background of the test (Fig. 4). All of the new test programs grew out of concern with the current Veterans Educational Assistance Program (VEAP). As of 1977, when the old GI bill ended, all personnel became eligible to participate in the basic VEAP plan. A participating service member must make monthly contributions to an education fund, which the government matches 2 for 1. Over his career, the individual can contribute a maximum of $2700; after matching, this yields a total of $8100 to support post-service education.

Participation rates in basic VEAP have been low, prompting concern that the program does not constitute an effective enlistment incentive. As a result, the Army began testing expanded VEAP benefits, called "kickers," in 1979. The kickers were lump sums of up to $6000, added to the funds of high-quality personnel in critical occupational specialties. Rand's analysis of this program indicated that the

kickers probably produced a small increase in enlistments.* However, the results were not conclusive, possibly because the kickers were not very large. Therefore, after the 1979 test the Army began planning a new experiment with expanded kickers, to be implemented in 1981.

At the same time, interest in educational benefits was rising in Congress, where members were concerned that the contribution requirement may have diluted the effectiveness of VEAP. In 1980, Congress considered two noncontributory plans, but did not enact them; rather it directed the Department of Defense to include both in the 1981 test.

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*G. W. Haggstrom, T. J. Blaschke, W. K. Chow, and W. Lisowski, *The Multiple Option Recruiting Experiment*, The Rand Corporation, R-2671-MRAL, 1981.

ENLISTMENT TEST PROGRAMS

Contributory

CTL ● Basic VEAP (+ $2/4/6K kickers in Army)

UVK ● Army $8/12K "Ultra VEAP" kickers

Noncontributory

NCV ● Noncontributory VEAP

T/S ● Tuition/stipend + Indexing / Transferability / Cashout

Figure 5

ENLISTMENT TEST PROGRAMS

The Congressional action led to an enlistment test with the four programs shown in Fig. 5. The control program is the basic VEAP plan, with kickers added for selected personnel in the Army. A kicker of $2000 is given for a 2-year term of enlistment, $4000 for a 3-year term, and $6000 for a 4-year term. This plan was in effect nationwide before the test, and it remained in effect in the control areas during the test period (December 1980 through September 1981). Thus, the control condition represents a situation in which no change occurred in educational benefits between the base period and the test period.

The second contributory program is the one offering enhanced kickers in the Army. Called "Ultra VEAP" by the Army, this plan adds larger amounts to the individual's basic fund: $8000 for a 2-year enlistment, and $12,000 for a 3-year or 4-year enlistment. Under this plan, only the Army has the Ultra VEAP program; the other services offer just basic VEAP.

The third and fourth programs are the noncontributory plans developed by Congress. The Noncontributory VEAP plan provides the same total amount as basic VEAP (plus the kickers of up to $6000 in the Army), without requiring any payment by the individual. The fourth program is considerably more generous, providing a payment for tuition and a stipend for living expenses. In addition, it has several other special features: The value of the benefit is indexed to rise with the cost of education; and if the service member later decides to reenlist, he may choose to transfer his benefits to a dependent or to "cash out" of the program to obtain 60 percent of its value.

Throughout this presentation we refer to these programs with the abbreviations shown at the left in Fig. 5.

NET BENEFIT AMOUNT

Cell	Maximum benefit	
	Army	Navy, AF, MC
CTL	11,400	5,400
UVK	17,400	5,400
NCV	14,100	8,100
T/S	15,600	15,600

Figure 6

NET BENEFIT AMOUNT

The four programs differ substantially in value. The amounts shown in Fig. 6 represent the net value of the benefit; that is, removing any contributions that the individual must make. In addition to the differences across the programs, there is an important cross-service difference: The Army offers a substantially larger amount than the other services in three of the four plans. Only in the Tuition/Stipend plan do all of the services offer the same level of benefits. These differences could lead to cross-service movements if individuals "shop around" while they are considering enlistment.

EDUCATIONAL ASSISTANCE TEST DESIGN

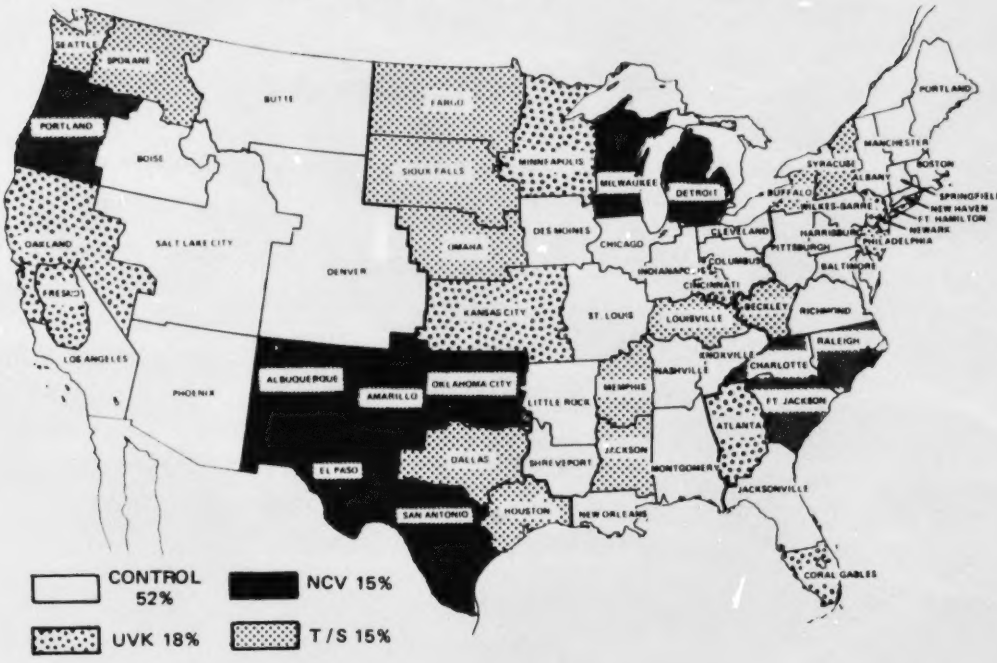

Figure 7

TEST DESIGN

After these programs had been formulated by DoD and the Congress, Rand was asked to design a method of assigning the test programs to matched sets of geographic areas across the nation. The result was the design shown in Fig. 7, in which the shaded areas represent the different localities offering the various programs. The allocation algorithm ensured geographic balance, and matched all test cells in 1979 enlistment rates, local unemployment rates, and local civilian wage rates.* Matching the cells on previous enlistment rates, in particular, ensured that uncontrolled factors affecting enlistments should be approximately equalized across the test programs. Thus, we are reasonably confident that the four program areas were well balanced at the beginning of the test.

*Geographic areas served by Armed Forces Entrance and Examining Stations were randomly selected with the constraint that the means in all cells be closely matched on five variables: latitude; longitude; unemployment rate for all workers 16 years and older; wage rate of manufacturing production workers; and enlistments in all services, as a proportion of the qualified military-available population.

ELIGIBILITY CRITERIA

- High school diploma
- AFQT of 50 or above

} High quality

- Enlist in covered specialty

Figure 8

ELIGIBILITY CRITERIA

A final point in the test design concerns the eligibility criteria (Fig. 8). Although any enlistee can participate in the basic VEAP plan, only certain people are eligible for the VEAP kickers and the noncontributory programs. To be eligible, an enlistee must meet the "high quality" criterion--having a high school diploma and an AFQT score in the 50th percentile or above--and he must enter one of a set of critical specialties designated by the services and DoD.

COVERED SPECIALTIES

Service	Types of specialties	Percent of training seats covered
Navy	Technical	10
Air Force	Mixed	18
Army	Primarily combat arms	62

Figure 9

COVERED SPECIALTIES

The services differ sharply in the nature of the specialties covered (Fig. 9). The Navy, for instance, selected mostly technical skills for its test, whereas the Air Force included a mix of technical skills and others, and the Army included mostly combat arms jobs. The Army program is also much broader; skills included in the Army test cover almost two-thirds of enlistees.

We will not show results for the Marine Corps. The Marines implemented a test with many additional constraints, and we have not undertaken an analysis of their program.

ENLISTMENT TEST RESULTS

Figure 10

ENLISTMENT TEST RESULTS

We now present the results for high-quality male enlistment contracts. The results cover the complete period of the test, from December 1980 through September 1981. Our principal analysis includes only males because in the Army--the service with the largest test--most of the eligible specialties are in the combat arms skills open only to males. We have looked at results for females and lower-quality males, but the effects for those groups are generally small. In addition, most of the analysis we present will focus on total enlistments by high-quality males, whether in an eligible specialty or not. We expected to find substantial spillovers into non-covered specialties, as indeed we have, and so did not want to be too narrow at the outset.

ENLISTMENT RESULTS: AIR FORCE
(HIGH QUALITY MALES, DEC-SEP)

Program	Enlistment contracts FY80	Enlistment contracts FY81	Ratio FY81—FY80	Change over CTL
CTL	16,982	18,155	1.07	—
NCV	5,095	5,643	1.11	3.6 (2.3)
T/S	5,110	5,766	1.13	5.6* (2.3)

*Statistically significant at 95%

Figure 11

ENLISTMENT RESULTS: AIR FORCE

Looking first at the Air Force data to illustrate our methodology (Fig. 11), we see that in the control cell the Air Force had 18,155 high-quality male enlistments during the test period. During the same months of FY80 the corresponding number was 16,982. Taking the ratio, we see that during the ten months of the test the number of Air Force enlistment contracts signed by high-quality males was somewhat greater than last year, as shown by the ratio of 1.07. The control cell is the one cell of the test in which the educational benefit offerings of all the services are the same this year as last, so if we find that one of the test program cells has outperformed the control cell, we can interpret the extent of that outperformance as a measure of the effectiveness of the test program. Indeed, the column headed "Change over CTL" shows that the noncontributory VEAP cell did about 4 percent better than the control cell.

The numbers in parentheses are the standard errors of the estimates of program effects. Because there are random factors in the decision to enlist, if we ran this experiment again we might get slightly different results. Typically, it is assumed that the true value of an effect lies within a band extending two standard errors above and below the estimate. The important question here is whether we could have observed effects as large as we have if the programs really had no impact at all. The asterisks indicate those effects for which this probability is very small (less than 5 percent).

Thus, we conclude that the NCV program may not have increased Air Force enlistments. The effect of the Tuition/Stipend program, however, is quite clear: It apparently raised enlistments by about 5-1/2 percent.

ENLISTMENT RESULTS: NAVY
(HIGH QUALITY MALES, DEC-SEP)

Program	Enlistment contracts FY80	Enlistment contracts FY81	Ratio FY81—FY80	Change over CTL
CTL	14,056	13,393	0.95	—
NCV	4,742	4,673	0.99	3.4 (2.4)
T/S	4,559	4 701	1.03	8.2* (2.6)

*Statistically significant at 95%

Figure 12

ENLISTMENT RESULTS: NAVY

Turning to the Navy, we see results that are broadly similar (Fig. 12). The Navy did somewhat worse than the Air Force in the control cell--about 5 percent behind the previous year. The NCV program did not appear to help the Navy, but the Tuition/Stipend cell outperformed the control cell by more than 8 percent. This effect of the Tuition/Stipend program appears to be larger than in the Air Force, but given the magnitudes of the standard errors one should be cautious in drawing conclusions about the relatively small difference between these two services.

ENLISTMENT RESULTS: ARMY
(HIGH QUALITY MALES, DEC-SEP)

Program	Enlistment contracts FY80	Enlistment contracts FY81	Ratio FY81—FY80	Change over CTL
CTL	12,041	14,650	1.22	—
UVK	4,189	5,541	1.32	8.7* (2.6)
NCV	3,749	4,556	1.22	-0.1 (2.5)
T/S	3,750	4,284	1.14	-6.0* (2.4)

*Statistically significant at 95%

Figure 13

ENLISTMENT RESULTS: ARMY

The Army numbers, however, look quite different from those of the Navy and Air Force (Fig. 13). First, we note that the Army did much better than in the previous year at recruiting high-quality males in all the cells. This big increase in enlistments shows why experiments of this sort are so important if we are to assess the usefulness of new programs. If, for example, the Army had implemented the UVK program nationwide in 1981, we presumably would have observed a 32 percent increase in enlistments, and might have been led to attribute all of that increase to the UVK program. With this test, we can see that even without the new program the Army would have done 22 percent better than in the previous year, so the effect of the Ultra-VEAP kickers was only to add 9 percent to enlistments (1.32 divided by 1.22).

The Noncontributory VEAP cell did about the same as the control cell, leading to an essentially zero estimate of the effect of this program.

Finally, we come to the Tuition/Stipend program in the Army. This program apparently reduced Army enlistments by about 6 percent. When we first saw this negative effect early in the test period, we thought it might be due to lags in the implementation of this new and complex program. But far from disappearing, the effect persisted right up to the last months of the test.

NET BENEFIT AMOUNT

Cell	Maximum benefit	
	Army	Navy, AF, MC
CTL	11,400	5,400
UVK	17,400	5,400
NCV	14,100	8,100
T/S	15,600	15,600

Figure 14

BENEFITS AMOUNTS

The negative response to the Army's Tuition/Stipend program is truly a paradox. Even in the Army the Tuition/Stipend program is worth considerably more than the control program. The greater value is evident in the calculations we presented earlier (Fig. 14), netting out the individual's contributions. These calculations also suggest an answer to the paradox. In every cell except the Tuition/Stipend cell the Army offers substantially greater benefits, because of its kickers, than do the other services. Only in the Tuition/Stipend cell are the benefit amounts identical. Thus we are led to conclude that the negative effect in the Army T/S cell is attributable to the Army's not being able to offer greater benefits than the other services, as it could in the control cell. This suggests that if we were to go to a uniform benefit of this sort, one result would be a reduction in Army high-quality enlistments.

ENLISTMENT RESULTS: UVK CELL
(HIGH QUALITY MALES, DEC-SEP)

Service	Change over CTL
Army	8.7 (2.6)
Navy	8.4 (2.4)
Air Force	1.4 (2.1)

Figure 15

ENLISTMENT RESULTS: UVK CELL

The question naturally arises, then, whether allowing the Army to offer greater educational benefits reduces enlistments in the other services, or acts instead to expand the total enlistment market. Fortunately, the UVK cell provides a straightforward test to answer that question (Fig. 15). Relative to the control cell, the Army offered an additional $6,000 in kickers in the UVK cell.

The Army's 9 percent gain in enlistments under the UVK program was not matched by losses on the part of the Navy and Air Force. Indeed, the Navy had substantially better recruiting success in the UVK cell than in the control cell, while the Air Force did about the same in one cell as in the other. These two services, therefore, appear not to have been hurt by the increase in the Army's kickers.

CONTROLLING FOR IMBALANCES

- Controls for:
  - Unemployment
  - Civilian earnings
  - Recruiters
  - Program advertising
- Multivariate regression model
- No substantial changes in estimates

Figure 16

CONTROLLING FOR IMBALANCES

Part of any unusual results we find in these simple comparisons of the cells could reflect imbalances across the various test areas. For example, if one cell experienced a big jump in unemployment while the others did not, that would be a potentially significant imbalance. The cells were matched on the average levels of unemployment and other variables, but they could have experienced different changes over the last two years. Of course, substantial imbalances are unlikely because the cells are geographically dispersed, but to allow for the possibility we controlled for a variety of factors--among them civilian labor market conditions, recruiter force levels, and advertising for the programs--in a multivariate regression model. We also examined possible trends over time in the effects, but none were important.

Controlling for the various factors introduced no significant changes in the estimates of program effects.

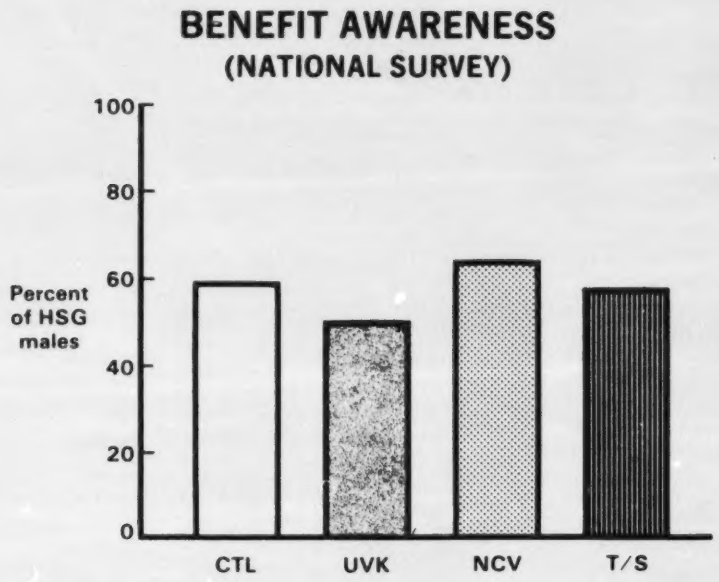

Figure 17

BENEFIT AWARENESS

There is another sort of imbalance, however, that could distort the results: if, despite the deliberate balancing of advertising expenditures in the three test program cells, youths in one cell were more aware of the availability of educational benefits than in another.

As part of our study of the test, a nationwide survey of a random sample of 1500 young men was conducted. One of the questions that was asked of the survey respondents was whether they thought that any of the services offered benefits that would pay for postservice education. We found that among the high school graduates in the survey, awareness of the availability of some sort of educational benefits (Fig. 17) was approximately the same in each of the test areas. The results for other measures of awareness--recall of advertising, for example--were essentially the same.

RECRUITER DISCUSSION OF BENEFITS
(APPLICANT SURVEY)

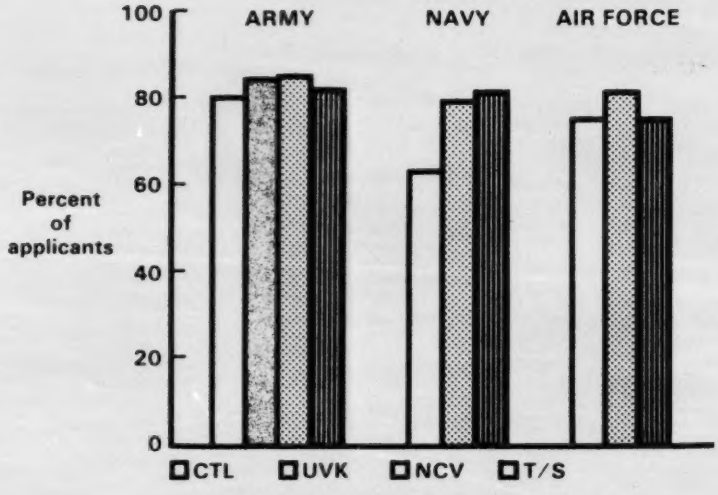

Figure 18

RECRUITER DISCUSSION

A second survey was conducted of 3700 military applicants: young men who had made a first step toward service by taking the military aptitude test. Among the questions asked of these young men was what enlistment incentives their recruiters had discussed with them. Educational benefits topped the list, and again (Fig. 18) we see little imbalance across the cells, or across the services. Only the Navy control cell is a little out of line, but of course in that cell the recruiter had only basic VEAP to offer. The Army apparently sold educational benefits a little more strongly than the other services, perhaps because their broader skill list made more recruits eligible. Most importantly, we see that Army recruiters did vigorously sell educational benefits in the Tuition/Stipend cell.

Overall, there is little evidence that the test was compromised by imbalances, either in such directly measurable factors as we have been able to include in our regression analysis, or in less easily observable factors such as awareness of the programs or the vigor with which they were sold.

STRUCTURING A PROGRAM

- **Skill targeting**
- **Loan repayment**
- **Inflation indexing**
- **Transferability**
- **Bonuses**

Figure 19

STRUCTURING A PROGRAM

The principal issue for the test was the ability of the test programs to bring in larger numbers of high-quality enlistees. The data shown so far answer that question.

However, the complex nature of the four packages in the test raises additional questions that need to be answered in the process of structuring a new educational benefit program (Fig. 19). For example, did skill targeting successfully channel recruits into the eligible skills? Focusing on some potentially expensive features of proposed benefit plans: How much effect can we expect from provisions such as loan repayment, inflation indexing, and transferability? And finally, how do the effects of educational benefits compare with those of cash bonuses? Although the comparisons we have shown among the four test programs have demonstrated the broad potential of educational benefits, they cannot answer these more detailed questions.

ARMY SKILL ELIGIBILITY

Skill group	Eligible	
	Period I	Period II
I: Mostly combat	Yes	Yes
II: Mostly noncombat	No	Yes
Others: Noncombat	No	No

Figure 20

ARMY SKILL ELIGIBILITY

Turning first to the question of skill targeting, we note that the Army program is the one most likely to show skill-specific effects, because the Army's program involves the largest number of skills and the greatest proportion of the force. In addition, the Army program was expanded during the test period, lending us an opportunity to observe the result when a targeted program was changed.

Fig. 20 shows the characteristics of skills that were covered during two periods of the test. During the first period, from December through February, only a restricted set of skills offered the benefit. These were mostly in the combat arms, and they remained eligible throughout the test.

However, at the end of February the Army broadened eligibility by adding a new group of skills, those identified as "Group II" skills in this chart. They are mostly noncombat occupations, including truck repair specialists, cooks, clerical personnel, and the like. Finally, a third group of skills, mostly noncombat, remained ineligible for benefits throughout the test period.

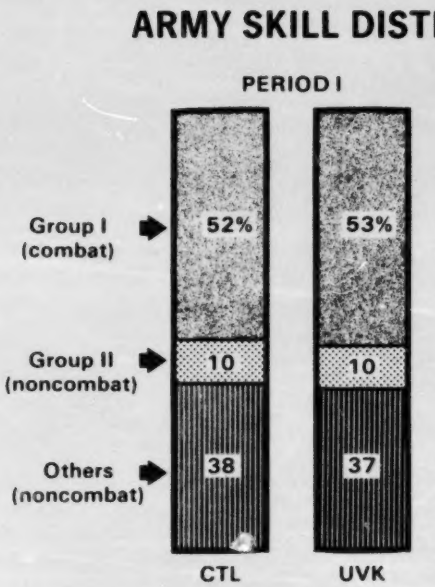

Figure 21

ARMY SKILL DISTRIBUTION: PERIOD I

Fig. 21 shows the distribution of enlistments into the three skill groups during Period I of the test, when only Group I skills were eligible. For simplicity, we display only the results for the control cell and the UVK cell, but the results are similar in the other cells.

The first bar indicates that in the control cell during that period, 52 percent of all high-quality enlistees went into Group I skills, 10 percent into Group II skills, and 38 percent into the other occupations. The second bar shows that the distribution of skills in the Ultra-VEAP Kicker cell was essentially the same. This suggests that in Period I, the more generous UVK program was not very effective in channeling high-quality enlistees into combat skills.

However, this does not mean that UVK was ineffective in general. Because more people were brought into the service under the UVK program, more individuals entered the combat arms skills than would have entered if the UVK program had not been present--but only because the program attracted more people, and not because it channeled them into combat jobs.

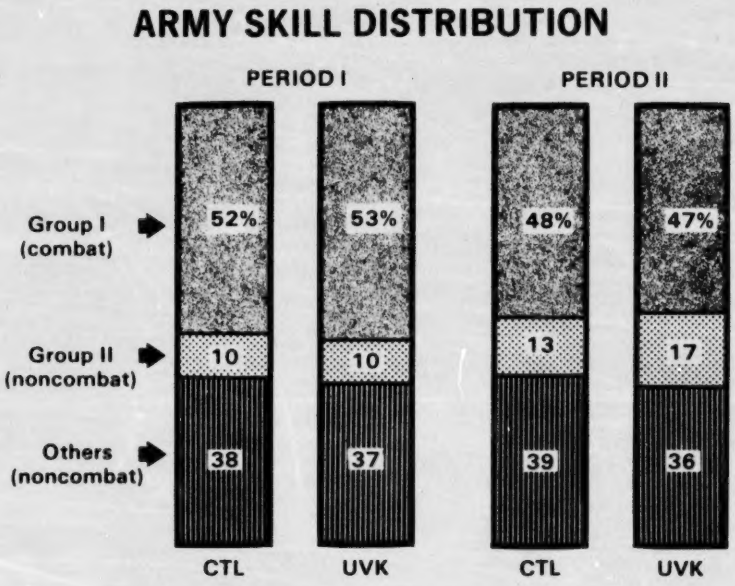

Figure 22

ARMY SKILL DISTRIBUTION: PERIOD II

Fig. 22 shows what happened when the second group of skills was added to the test. At that point, we did observe a marked increase in Group II enlistments. In the control cell, the proportion of high-quality enlistees entering Group II skills rose from 10 percent to 13 percent.

It is possible that this change reflected a simultaneous change in Army recruiting policies, perhaps resulting from more emphasis being given to noncombat skills. However, there was an even larger change in the UVK cell, from 10 percent to 17 percent. This suggests that the addition of the Group II skills to the program moved people into these occupations.

Which group suffered as a result of the change between Period I and Period II? A very small decline occurred in the excluded skills, but a large decline occurred in the combat skills--from 53 to 47 percent in the UVK cell. Thus, it appears that one of the main effects of expanding the benefits beyond the combat skills was to draw high-quality enlistees away from the combat arms, into occupations that are apparently more desirable.

RESPONSE TO BENEFIT FEATURES
(APPLICANT SURVEY)

	Percent increase in enlistments*
Educational benefit levels	
$ 9,000	1.0
$15,000	4.3
$23,000	8.1
Additional features	
Existing loan repayment	1.0
Future loan repayment	2.0
In-service use	1.4
Inflation indexing	1.9
Transferability	0.3

*Relative to current rate.

Figure 23

RESPONSE TO BENEFIT FEATURES

To examine the effects of other features of educational benefits, we used information from the survey of applicants. Fig. 23 shows the response of high-quality applicants in that survey to a number of program features that are being considered by Congress. To estimate the applicants' behavioral response, we asked them to report the likelihood that they would enlist, first assuming that the current set of enlistment options was available, and then assuming that DoD offered a variety of additional incentives. To provide a benchmark for translating respondents' verbal reports into actual enlistment probabilities, we examined data from previous studies in which survey respondents had been followed up to determine their enlistment rate.

The upper panel of Fig. 23 shows that military applicants are fairly responsive to increases in basic benefit levels. For example, this analysis indicates that if a $15,000 benefit were offered, 4.3

percent more applicants would enlist than under current conditions. We view this as a lower bound for the total effect on enlistments, since these data come entirely from a sample of military applicants; if such a program were actually implemented, it would also expand the applicant pool and magnify the effects.

The main point, however, is not the absolute size of these effects, but the relatively small size of the effects for a variety of additional special features of benefit plans. The lower panel of Fig. 23 shows five special features that might be added to a basic benefit program. Notice that none of them produces an estimated increase of more than 2 percent. For some of these, simple explanations come readily to mind. Repayment of existing federal education loans, for example, probably applies to a very small group of applicants who have taken out such loans; similarly, many applicants are probably aware that some in-service education is already available. In contrast, the small effect of inflation indexing is not consonant with the substantial value that indexing adds. We infer that many young men considering military service do not fully appreciate the implications of indexing for their own situation.

Finally, the small increment due to adding a transferability option is not especially surprising. Transferability, after all, was designed as an incentive for reenlistment, and it should not be expected to appeal strongly to young people contemplating an initial enlistment decision, especially since only a small proportion of initial enlistees have dependents.

EDUCATIONAL BENEFITS VS. BONUSES
(APPLICANT SURVEY)

Educational benefit levels	Percent increase in enlistments*
$ 9,000	1.0
15,000	4.3
23,000	8.1
Bonus levels	
$ 5,000	1.8
9,000	5.3
15,000	8.1

*Relative to current rate

Figure 24

EDUCATIONAL BENEFITS VS. BONUSES

We also used the Applicant Survey data to examine the appeal of cash enlistment bonuses. Bonuses are not directly relevant to the education test, but they do represent an alternative policy option of considerable importance. Here we show the response of high-quality applicants to three levels of education benefits, compared with their response to three levels of enlistment bonuses that might be offered. These data suggest that larger bonuses, as well as larger educational benefits, could be used to increase the enlistment rate among people who take the test for military service. This is important, because it is often argued that educational benefits appeal uniquely to the capable high school graduate, whereas cash bonuses tend to draw men of lower ability and education. The applicant data do not support that thesis.

These results, of course, should not be used to make a direct cost comparison between the two types of incentives. For benefit programs in particular, one must make various assumptions to calculate

costs, and depending on the assumptions the comparison could favor either bonuses or educational benefits.

We expect soon to have much more complete information on bonus effects from a new national test directed by Congress. Recent legislation authorized a substantial increase in enlistment bonuses and broadened eligibility criteria to include 3-year enlistees in the Army. The Secretary of Defense was requested to implement a test to assess the effectiveness of the expanded bonuses. Rand is participating in the design of this new test, and we expect it to produce extensive experimental data on the potential of enlistment bonuses.

SUMMARY: SPECIFIC FINDINGS

- Army UVK plan increased enlistments 9-11%
- T/S plan increased Navy and Air Force enlistments 5-8%
  - But reduced Army enlistments
- Test appears uniformly implemented
- Combat specialties hurt by adding noncombat specialties
- Applicants much more responsive to benefit levels than to other provisions
- Bonus offers alternative management tool

Figure 25

SPECIFIC FINDINGS

Before turning to our conclusions, let me summarize our specific findings to date (Fig. 25). First, the test has demonstrated that educational benefits did bring about substantial increases in enlistments. The Army's Ultra-VEAP Kicker program increased Army enlistments by 9 percent (slightly more, according to the regression estimates).

The Tuition/Stipend Program, which offered equal benefits to all services, also increased Navy and Air Force enlistments by smaller amounts. However, that program reduced Army enlistments by 6 percent, compared with the results in the control program, in which the Army was able to offer larger benefits than the other services. We concluded that the removal of the differences between the Army and the other services explains the Army's loss of enlistments under the Tuition/Stipend plan.

Our analysis also addressed the possibility that the effects might have been distorted by extraneous factors, such as imbalances across the test cells or differences in program implementation. We found no

evidence of such distortions. The test appeared to be uniformly implemented across the test cells and the services. Moreover, our multivariate analysis revealed no imbalances that substantially changed our estimates of program effects.

Among the more specific effects examined: We found evidence that recruiting for the combat specialties was hurt when the Army added non-combat skills to the test. The survey data showed that military applicants were much more responsive to the basic level of benefits than to any of the other specific provisions, such as loan repayment or indexing. Finally, the survey results indicate that cash bonuses, as well as educational benefits, can be effective incentives for recruiting high-quality personnel.

CONCLUSIONS

- **Large benefits produce significant increases in enlistments**
- **Uniform benefits may create undesired effects**
  - **Reduce Army enlistments**
  - **Draw recruits out of combat arms**
- **Targeted program can be effective**

Figure 26

CONCLUSIONS

The test results suggest several policy-relevant conclusions (Fig. 26). First, remember that when we began this study, after the analysis of the 1979 experiment, there was considerable doubt about whether educational benefits would attract any appreciable number of recruits. At that time, analysis of the small Army kickers indicated effects that were not statistically significant. Now, because of the findings reviewed in Fig. 25, we conclude that educational benefits can be effective.

Of course, this does not indicate whether the effects of educational benefits would justify their costs--including possible reductions in retention rates. Nor does it show whether alternative incentives, such as cash bonuses, would be more cost-effective than educational incentives. The test does demonstrate, however, that educational benefits are capable of producing significant increases in high-quality enlistments.

The study also shows that the effects of educational benefits depend on the way the benefit package is structured. The results suggest that a large uniform benefit--one that offers the same amount to all enlistees--may create some undesired effects. A program that offers the same benefit across all the services, like the Tuition/Stipend program, could reduce Army enlistments. Moreover, opening the program to enlistees in all skills might produce the very effect we observed when the Army broadened its program: that is, drawing recruits out of the combat arms into jobs that are more attractive to recruits.

In contrast, the test has shown that a targeted program, in which the most generous benefits are offered only to selected enlistees, can be effective in attracting high-quality recruits into both critical and noncritical skills. All of the test programs offered a differential benefit to a restricted group. These results suggest that differential benefits can improve manning in hard-to-fill areas at the same time that they increase the overall number of high-quality recruits.